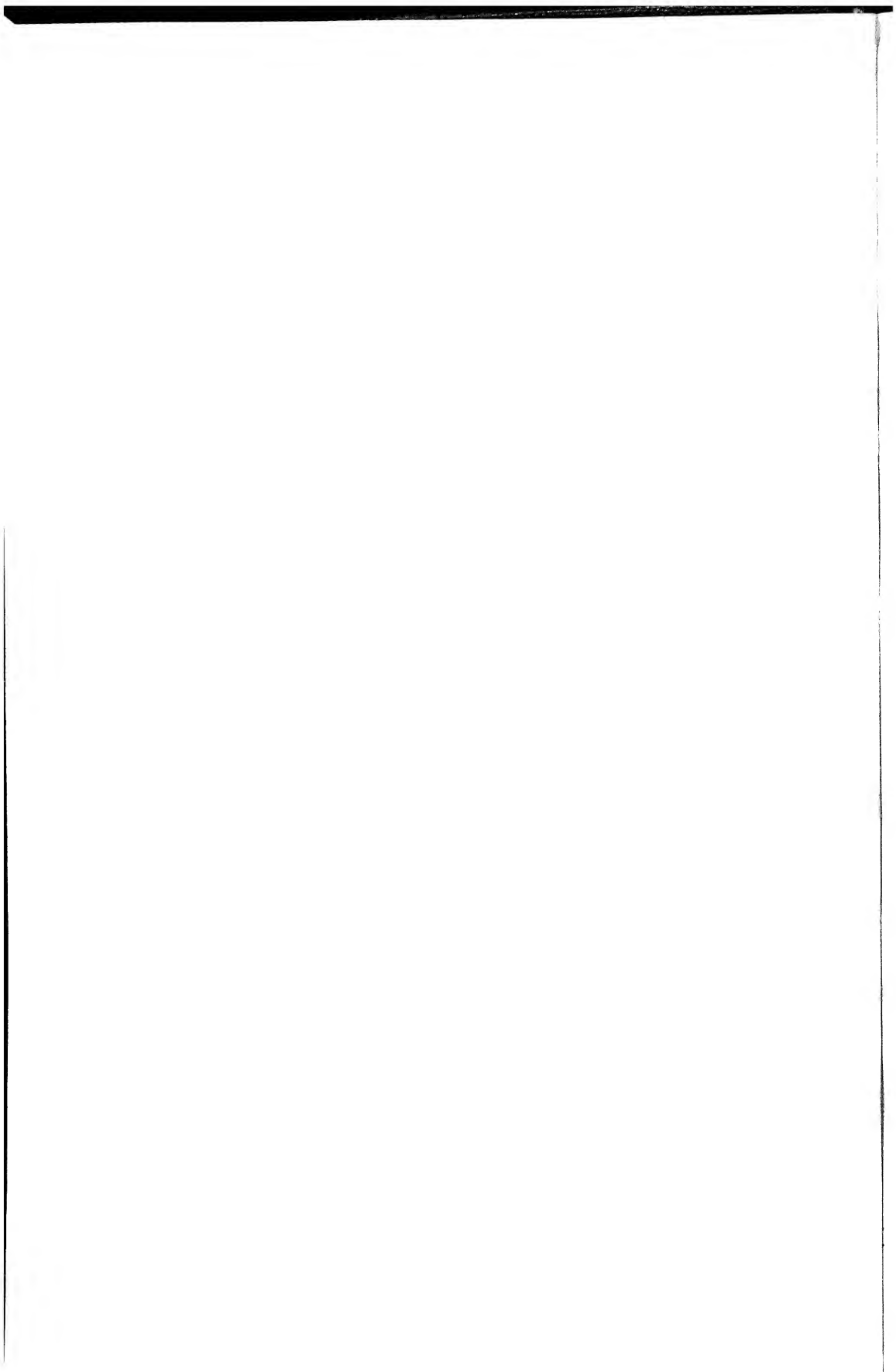


but they must choose to do so before it is too late. We hope this book will prove useful in that effort.

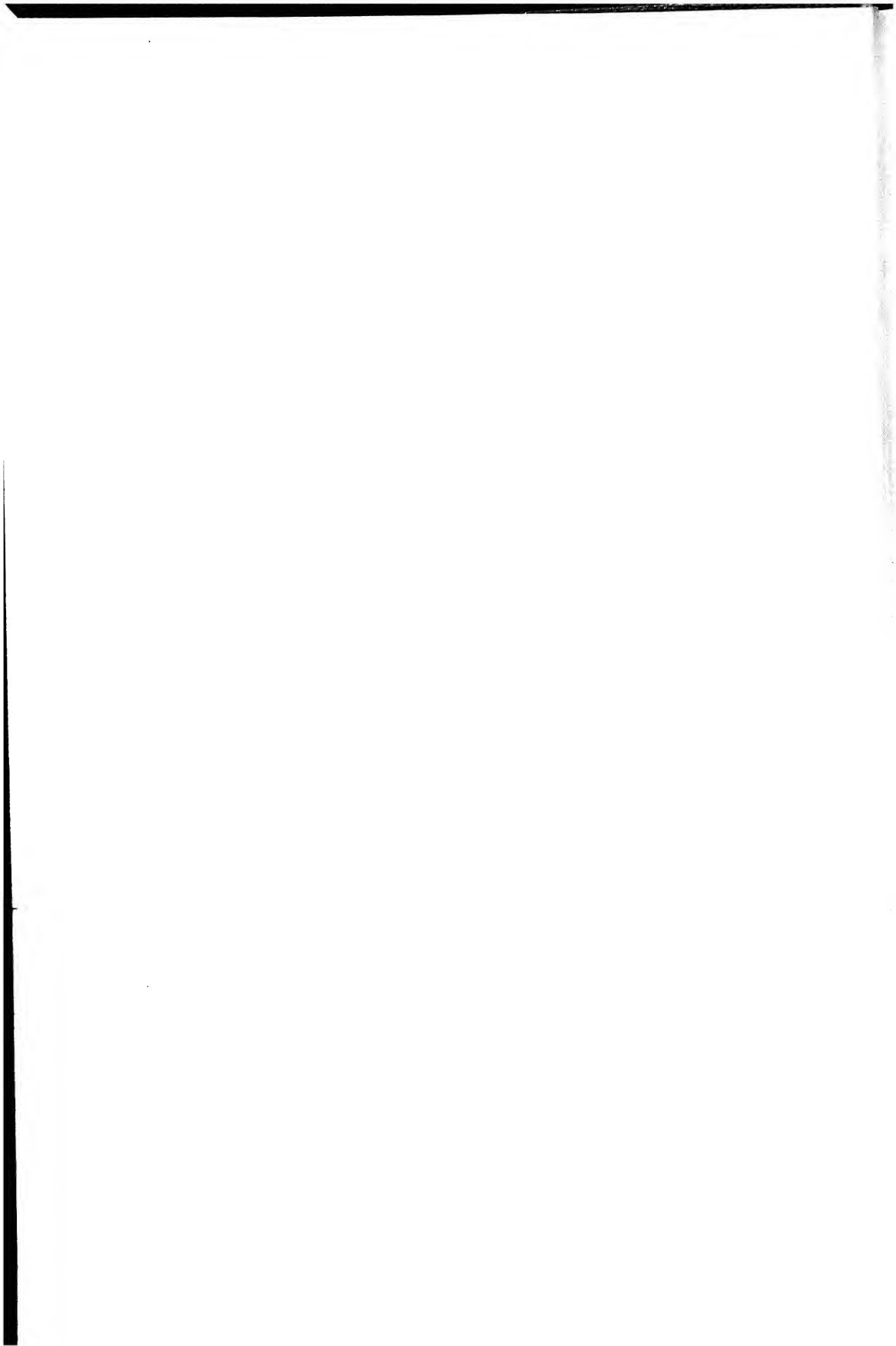
This book could not have been written without the cooperation and contribution of many others, including both fellow researchers and the literally hundreds of business managers who have shared their experience and insight with us. We are also grateful for the institutional support provided by the Harvard and the Stanford Business Schools and their respective Deans, John McArthur and Robert Jaedicke. A complete listing of those who have assisted us in understanding the various facets of the subject we have tackled would be impossible, but we would be remiss if we did not acknowledge the role that a few key individuals played in our intellectual growth.

For example, our discussion of the historical development of American manufacturing in Chapter 2 was deeply influenced by the writings of and personal interchanges with Professors Alfred Chandler, Jr., and Nathan Rosenberg. In this, as well as other chapters, we also drew upon the perspectives of our former colleagues, Professors Wickham Skinner and the late William Abernathy. Similarly, part of Chapter 3 is drawn from a *Harvard Business Review* article, “Managing as if tomorrow mattered,” that one of us co-authored with Professor David Garvin, and a portion of Chapter 4 is based on another *Harvard Business Review* article, “How should you organize manufacturing?,” co-authored with Professor Roger Schmenner. In like fashion, our analysis of the impact of cost accounting systems on manufacturing behavior benefitted from the writings of Professor Robert Kaplan and our many discussions with him.

The research reported on in Chapter 6 was conducted with the assistance of Paul Adler, Bruce Chew, and Russell Radford when they were doctoral students or postdoctoral associates at Harvard. We are delighted that they, as faculty members at prestigious universities, are still carrying on aspects of this research and continue to contribute to our understanding of the impact of managerial practice on productivity growth. Our discussions of process control and organizational learning in Chapters 8 and 9 also benefitted greatly from our association with Professors Roger Bohn, Ramchandran Jaikumar, and Richard Walton. Many of the ideas reported on in Chapter 10 originated in work that we did in conjunction with our colleague, Professor Earl Sasser. Similarly, our doctoral student, Takahiro Fujimoto, and our colleagues, Professors Paul Adler and Hank Riggs,



Dynamic Manufacturing



DYNAMIC MANUFACTURING

Creating the
Learning Organization

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Kim B. Clark



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Preface

Why have American manufacturing companies been responding so hesitantly and half-heartedly to the onslaught of foreign competition? Why have they been so reluctant to learn from the example of their most effective competitors? Can companies that have for many years, possibly even decades, regarded manufacturing excellence as a secondary contributor to competitive success—as an uncertain liability rather than a powerful asset—transform their manufacturing function into a source of competitive advantage? And how can they go about doing so? These are some of the questions that led us to write this book.

America's manufacturing competitiveness has been in serious decline for well over a dozen years, and we have been writing, collectively and individually, about this problem for much of that period. Our voices, together with a few others, initially were drowned out by a chorus of confident assertions that no problem existed or, if it did, that it was minor and transitory. Now, however, there appears to be wide agreement that the problem is major and enduring. A torrent of books and articles has appeared in the past few years describing the manufacturing philosophies and techniques used by world class companies, and why they have proven to be so effective. A number of highly visible companies have applied many of these approaches in their own factories and have experienced astounding improvements in their manufacturing competitiveness. Management experts, academics and practitioners alike, for once are almost united in their assessment of the deep-seated nature of the competitive problems American companies are facing and in their recommendations: quality improvement and inventory reduction programs,

employee involvement, closer interfunctional linkages, flatter organizational hierarchies, and more rapid adoption of new manufacturing technologies. CEOs of companies in industries ranging from steel to semiconductors declaim the need for a “cultural revolution” in management.

Yet despite this outpouring of diagnoses, prescriptions, and virtuous resolutions, not enough has changed. A number of companies have taken the first steps to address the problems that have been accumulating over many years, and some have made considerable progress. However, too few have fully grasped and implemented the kind of fundamental changes that the new industrial competition requires, changes that usually begin in the manufacturing function but may extend to encompass the entire organization. As a result, journalists looking for rays of optimism in the American industrial landscape return again and again to the same handful of companies for inspiration. Even within many of these companies the new approaches spread with difficulty.

As the U.S. dollar plummets against other major currencies, and foreign manufacturers move in to acquire or build factories in North America, American companies retain their foreign suppliers and are puzzlingly reluctant to shift production back from their offshore facilities. Even high-tech companies that find themselves losing position to foreign competitors—often from countries that have traditionally been viewed as followers and copiers rather than technological innovators—appear to be reluctant to invest in new manufacturing technologies and proprietary processes. Why haven’t such firms responded more aggressively to the erosion of their world markets? How *should* they respond? In the pages that follow we try to provide an answer.

Our perspective throughout this book is that the responsibility, both for these problems and their solution, rests firmly on the shoulders of management. But it is not just the management of the manufacturing function that has to change. Building a manufacturing advantage must begin there, but those changes must be augmented by reinforcing changes in other functions; consequently, this book is directed at managers throughout the company. Sustained progress can only occur if a significant proportion of them modify their attitudes, expand their understanding of the nature of changes required, and make a direct commitment to leading those changes. Many companies have the inherent capability to become manufacturing powerhouses,